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SUBJECT: KAZAKHSTAN: CIVIL NUCLEAR ENERGY SECTOR OVERVIEW

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11. SUMMARY: In response to reftel A, this report summarizes the structure, plans, projects, and players of Kazakhstan's civilian nuclear energy sector. Kazakhstan has the world's second largest uranium reserves after Australia and is currently the world's third largest uranium producer after Canada and Australia. Once the owner of the world's fourth largest nuclear arsenal, Kazakhstan voluntarily decommissioned its own weapons and continues excellent cooperation on cooperative threat reduction (CTR). Facing a 255-megawatt power deficit due to a poorly integrated power network, Kazakhstan wants to develop a domestic nuclear energy industry to help meet its power needs. Kazakhstan's nuclear power industry comprises the Ministry of Energy and Mineral Resources (MEMR) which sets energy policy, the state-owned nuclear power company Kazatomprom, and the National Nuclear Center, which conducts research and development. END SUMMARY.

PLANS TO DEVELOP NUCLEAR POWER IN KAZAKHSTAN

12. Kazakhstan is currently the world's third largest uranium producer after Canada and Australia. In response to reduced market demand due to the global economic crisis, on November 6, Kazatomprom lowered uranium production plans from 9,000 tons to 8,700 tons in 2008, and from 12,000 tons to 11,000 tons in 2009. Kazakhstan produced 6,637 tons of uranium in 2007. On December 15, Energy Officer met with Yevgheniy Ryaskov, Acting Director of the Department for Nuclear Industry and Atomic Energy at the Ministry of Energy and Mineral Resources (MEMR). He said that Kazakhstan currently exports all of the uranium it produces. However, from 1973 to 1998, the BN-350 plutonium breeder reactor owned by Kazatomprom generated approximately 1% of all electrical power in Kazakhstan. On April 22, 1999, the Government of Kazakhstan decided to shut down and decommission the BN-350 reactor. By the end of 2008, Russia's Afrikantov Research and Development Bureau plans to complete a feasibility study for the construction of a nuclear power plant in the vicinity of the decommissioned BN-350 reactor in Aktau, which would be equipped with Russian-made VBER-300 reactors that have been used on board Russian nuclear submarines.

KAZATOMPROM TO INCREASE PRODUCTION AND EXPORT OF URANIUM

¶3. As described in reftel C, Kazatomprom has ambitious plans to become a vertically integrated transnational corporation managing the full nuclear fuel cycle, including uranium mining, gas processing, isotopic enrichment, fuel pellet and fuel assembly production, and construction of nuclear power plants. The Northern mining group has uranium reserves of 750,000 tons; the Western mining group has 180,000 tons of uranium reserves in its North and South Karamurun mines; the Eastern mining group has 140,000 tons of uranium reserves; and the Southern mining group owns 70,000 tons of uranium reserves.

¶4. The Ulba Metallurgical Plant processes waste materials containing uranium (scraps and ashes), including 27% U-235, supplied to the United States as uranium dioxide powder, and 5% U-235 fuel pellets, supplied to Russia. On December 12, Ulba announced that Russia refused to place an order for fuel pellets from Kazakhstan as expected. Kazatomprom president Mukhtar Dzhakishev was nonplussed, saying, "If we lose the Russian market, Ulba will obtain more orders from China and Japan."

¶5. Ulba is the world's largest processor of uranium products, the second largest processor of beryllium products, and the third largest processor of tantalum and niobium products. In July, Kazatomprom abandoned earlier plans to participate in a tantalum mining project in Brazil due to the high asking price. On December 11, Ulba launched a tantalum powder shop. The production of powder for tantalum condensers is considered a breakthrough project for KazAtomProm and will be carried out under a national program called "30 Corporate Leaders," which makes Ulba eligible for federal financial aid.

NATIONAL NUCLEAR CENTER CONDUCTS RESEARCH AND DEVELOPMENT

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¶6. Established in 1993, the National Nuclear Center has an extensive research and production infrastructure, including three pilot reactors, an isochronal cyclotron, a particle accelerator, and a range of facilities for conducting experiments. The Center employs highly-qualified specialists in a number of affiliated institutes, such as the Nuclear Physics Institute in Almaty, Kurchatov, and Aksai; the Atomic Energy Institute in Kurchatov; the Geophysical Research Institute in Kurchatov, Borovoye, Almaty, Kaskelen, Aktobe, and Makanchi; the Institute of Radiation Safety and Environment; the Baikal production facility in Kurchatov; the State Research and Production Center for Blasting Operations in Almaty; among others. In 2011, the National Nuclear Center plans to open a Center for Nuclear Medicine and Biophysics, which will be equipped to diagnose and treat cardiovascular and oncological diseases.

KAZAKHSTAN'S MOTIVATIONS FOR PURSUING NUCLEAR POWER

¶7. On August 20, 2002, Kazakhstan adopted the Development Concept for the Uranium Industry and Atomic Energy from 2002 to 2030, which described the status of the atomic energy and uranium mining industry, described development trends, indicated future strategic priorities for the industry, and defined the official state policy for civil nuclear power. According to the Concept, it is in Kazakhstan's strategic national interest to increase uranium production, construct new uranium mines, increase the percentage of energy demand met by nuclear power, and eliminate the import of electricity.

¶8. The Concept identifies the following motivations for developing a civil nuclear power program:

-- Perennial power shortages in the south, expected to reach 1.9 to 2.0 billion kilowatt hours a year by 2030, even if Kazakhstan builds a new 2,000-megawatt power plant;

-- Kazakhstan's large deposits of uranium, which can be mined using a more environmentally-friendly in-situ leaching method;

-- Dependence on inefficient and environmentally-harmful coal-fired power plants that supply 84% of Kazakhstan's electrical power; and

-- An existing world-class nuclear training system.

¶9. In a December 15 meeting with Energy Officer, MEMR's Ryaskov stressed that Kazakhstan favors the development of nuclear energy over oil, gas, and coal as a future source of energy because its in-situ leaching uranium mining is much more environmentally friendly than the extraction of fossil fuels. Moreover, the cost of electricity generated by nuclear power plants is lower than that of coal- or gas-fired plants, while the lifespan of a nuclear plant is 60 years, compared to 25 for a coal-fired plant. Finally, Ryaskov noted that Kazakhstan would generate more revenue if it exported the majority of its oil, gas, and coal reserves and leveraged its uranium resources to supply domestic power.

GOVERNMENT ROLE IN THE CIVIL NUCLEAR SECTOR

¶10. On October 13, MEMR transferred its 100 percent ownership in Kazatomprom to the Samruk-Kazyna Sovereign Wealth Fund. Samruk-Kazyna will finance development and production projects if Kazatomprom itself does not have sufficient revenue. As Kazatomprom's Dzhakishev said on November 6, "If, for example, we are unable to raise capital for a new ore mill, we may turn to Samruk-Kazyna and borrow \$1.5 billion from the state fund to build the mill."

¶11. Kazatomprom's strong financial position, steady uranium production, and long-term contracts make Kazatomprom a low-risk and solvent borrower. In July, Kazatomprom announced plans to raise a two-year, \$300-million syndicated loan with the assistance of Citigroup. On November 27, Japan's Nippon Export and Investment Insurance increased its coverage for Kazakhstan-Japan joint uranium production projects from \$47.94 million to \$114.37 million.

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KEY NUCLEAR DECISION MAKERS

¶12. Policy for Kazakhstan's nuclear power industry is set by a number of influential decision makers, including Minister of Energy and Mineral Resources Sauat Mynbayev, Kazatomprom president Mukhtar Dzhakishev, Kairat Kadyrzhanov, director of the National Nuclear Center, and Kairat Kelimbetov, chairman of the Samruk-Kazyna Sovereign Wealth Fund.

¶13. In addition, two offices in MEMR are directly involved in decisions regarding the nuclear power industry. The Department for Nuclear Industry and Atomic Energy, currently supervised by Deputy Director Ryaskov, defines Kazakhstan's development strategy for the industry, while the Committee for Atomic Energy, chaired by Timur Zhantikin, issues licenses and carries out supervisory and monitoring functions.

¶14. The recent appointment of President Nazarbayev's close associates to senior management positions in Samruk-Kazyna and Kazatomprom indicate the strategic importance the political leadership attaches to the development of Kazakhstan's civil nuclear sector. On October 13, the Government of Kazakhstan named Nazarbayev's son-in-law Timur Kulibayev Deputy Chairman of Samruk-Kazyna and recommended he also chair Kazatomprom's Board of Directors. In addition, Nartay Dutbayev, a former advisor to the president and chairman of the National Security Committee (KNB), was appointed a vice president of Kazatomprom.

GOVERNMENT TO CREATE NUCLEAR REGULATING AUTHORITY

¶15. On September 16, Prime Minister Karim Massimov announced a plan to establish the State Nuclear Industry Supervision Agency under the Ministry of Energy and Mineral Resources. The new agency would have the authority to draft laws and regulations for the nuclear industry. At the time, Energy Minister Mynbayev said that "the International Atomic Energy Agency has made it a formal requirement for all countries with a civil nuclear power sector to set up an

independent nuclear energy committee or agency." The National Nuclear Center offered to host the new regulatory agency, but it is likely that MEMR's Committee for Atomic Energy will be merged with the new agency instead.

LEGAL FRAMEWORK FOR NUCLEAR POWER OPERATIONS

¶16. Kazakhstan's legal framework for nuclear power operations includes the Law on the Use of Atomic Energy; the Law on Export Controls for Arms, Military Technology, and Double-Use Products; the Decree on the Export and Import of Uranium and Uranium Products, Nuclear Fuel for Nuclear Power Plants, Special Equipment and Technologies and Dual-Purpose Materials; the Development Concept for the Uranium Industry and Atomic Energy Sector from 2002 to 2030, among others.

¶17. The Law on the Use of Atomic Energy empowers the Committee to develop rules and instructions to implement existing laws, issue nuclear-related licenses, monitor atomic energy use, conduct inspections, monitor radiation in Kazakhstan, inventory nuclear materials, and cooperate with relevant authorities from other countries and international organizations to ensure the safe use of atomic energy and the non-proliferation of nuclear arms and secure control of nuclear materials.

¶18. To ensure the efficient development of its nuclear power sector, in 2007, the National Nuclear Center developed a special national program currently under review by the Government of Kazakhstan. The program focuses on legal and regulatory issues, environmental and radiation safety, fundamental and applied research, non-proliferation support, uranium and nuclear material production, electricity generation by nuclear power plants, and staff training. According to Director General Kairat Kadyrzhanov, the most important element of this program is to enhance the legal framework, as Kazakhstan does not yet have any laws regulating the construction, organization, and operation of nuclear power plants.

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¶19. When asked whether Kazakhstan is party to an international liability regime, MEMR's Ryaskov responded that Kazakhstan has been a member of the International Atomic Energy Agency (IAEA) since February 14, 1994. According to Ryaskov, Kazakhstan signed an Agreement on the Application of Safeguards, under which all nuclear installations in Kazakhstan operate under IAEA supervision. Ryaskov added that all nuclear activities are carried out in compliance with IAEA rules and standards. On February 19, 2007, Kazakhstan also ratified the Additional Protocol to the Safeguards Agreement, which expands the IAEA's ability to verify the country's nuclear activities.

KAZAKHSTAN'S NUCLEAR WORKFORCE

¶20. The personnel for the atomic industry are trained at the special nuclear power and chemical metallurgy departments of four public schools in the south and east of Kazakhstan such as the Al-Farabi Kazakh State University (Almaty), Kazakh State Technical University (Almaty), East-Kazakhstan State University (Ust-Kamenogorsk), and the Shakarim Semipalatinsk State University (Semei). Kazakhstan also has quite a few technical universities, which train future engineers, technicians, and constructors.

¶21. According to Ryaskov, Kazakhstan's use of in-situ leaching methods means that its uranium production is not labor intensive. For example, he said that just 104 workers are used to develop the Karatau uranium field, whereas thousands would have been needed if they used an open mining approach. Highly qualified nuclear scientists and workers are employed at the BN-350 plutonium breeder reactor site, the National Nuclear Center in Kurchatov, and other nuclear energy facilities. Many of Kazakhstan's nuclear specialists received training at the Tomsk Technical Institute in Russia.

¶22. Ryaskov insists that Kazakhstan has enough highly-trained specialists to meet current obligations, "but to achieve our future goals, the trained workforce is not sufficient." MEMR plans to meet future staffing needs by developing a special training program. In

addition, the National Nuclear University of Kazatomprom, established in 2004, organizes advanced training and continuous professional education of technical staff. Kazatomprom subsidiary Geotechnology trains Kazatomprom employees on its in-situ leaching method as well as maintenance and radiological protection.

CURRENT COOPERATION WITH U.S. COMPANIES

¶23. Kazatomprom has existing partnerships with the following U.S. companies: Brush Wellman Inc., Exelon Corp., Freedom Alloys Inc., General Electric, and New York Nuclear Corporation. In addition, Kazatomprom subsidiary Ulba Metallurgical Plant supplies uranium dioxide powder to the United States. On October 18, 2007, Kazatomprom purchased 10% of Westinghouse Electric Company from Toshiba for \$540 million. In November 2007, Kazatomprom president Dzhakishev attended the Westinghouse shareholders meeting and announced that the company would supply fuel for Westinghouse nuclear reactors.

¶24. Kazatomprom uranium production is somewhat constrained by a deficit of sulfuric acid for on-site uranium processing, which the company plans to address by using up to 400,000 tons of sulfur stored by the Tengiz oil production consortium Tengizchevroil (TCO), in which Chevron has a 50% share and ExxonMobil a 25% stake. Kazatomprom buys sulfur from TCO and processes it at the Stepnogorsk Chemical Plant.

FUTURE OPPORTUNITIES FOR U.S. INDUSTRY

¶25. MEMR's Ryaskov was surprised that U.S. companies -- unlike companies from Japan, France, and Canada -- have not entered Kazakhstan's uranium mining market. He hypothesized that U.S. companies are not interested in Kazakhstan's uranium fields since the United States has large uranium deposits of its own. According to Ryaskov, Kazakhstan does not anticipate conducting any nuclear-related tenders in the near future. Nevertheless, post believes that Kazakhstan's nuclear institutions would welcome U.S. technology and expertise in existing projects.

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¶26. Kazakhstan is interested in acquiring or building small and medium-size nuclear reactors such as Russia's VBER-300. Ryaskov said that Kazatomprom considered acquiring AR-600 reactors from Westinghouse, but Westinghouse subsequently shifted to production of AR-1000 reactors, which do not fit Kazatomprom's needs. Ryaskov believes that U.S. companies cannot realistically compete to build nuclear power plants in Kazakhstan, since Kazakhstan plans to build small- and medium-sized nuclear reactors, while U.S. companies can offer only high-capacity reactors.

FOREIGN COMPETITORS

¶27. Reftel C describes in detail joint ventures between KazAtomProm and companies from Canada, France, Japan, China, Russia, and Ukraine. In addition,

-- In May, during the visit to Kazakhstan of South Korea's Prime Minister Han Seung Soo, Kazatomprom and Korea Hydro and Nuclear Power signed a long-term contract under which Kazatomprom will deliver 3,410 tons of uranium a year until 2017, which would represent 11% of South Korea's annual uranium consumption.

-- On October 24, Energy Officer met with D.C. Manjunath, Political and Commercial Counselor at the Embassy of India to discuss press reports of India's interest in uranium from Kazakhstan. Manjunath was unable to provide specific details on the timing, amount, or players in a possible transaction, but he did confirm India's increased interest in a deal with Kazakhstan and said that the signing of the U.S.-India Civil Nuclear Accord vastly expands India's options and possibilities. He noted that India's Department of Atomic Energy would be the lead agent on any uranium purchase. He also acknowledged that both governments plan to arrange state visits in 2009.

-- On November 27, the Government of Ukraine approved an agreement

to join the International Uranium Enrichment Center. The stake to be acquired by Ukraine will come from Russia's 90% share. On November 26, the Afrikantov Research and Development Bureau pledged to complete by the end of 2008 a feasibility study for a nuclear power plant in Aktau to be equipped with Russian-made VBER-300 reactors, which have a good record of operation onboard of Russian navy ships.

-- On December 15, National Nuclear Center Director Kadyrzhanov announced that in 2009-2010, the Center would conduct a feasibility study together with Japanese scientists to build a 50-megawatt experimental nuclear reactor in Kurchatov and bring it to design capacity in 2011-2018.

POLITICAL CONSIDERATIONS FOR NUCLEAR POWER COOPERATION

¶28. Kazakhstan is cautious in its choice of potential partners. For example, according to Ryaskov, since India did not have a waiver until recently from the Nuclear Suppliers Group, Kazakhstan did not consider India a potential customer, regardless of India's high demand for uranium. After India obtained the relevant waiver, Kazakhstan acknowledged its willingness to supply uranium to India for all types of civilian nuclear reactors.

¶29. Kazakhstan plans to pursue nuclear power development in order to meet domestic power shortages, minimize environmental impact, and take advantage of its extensive uranium reserves, processing facilities, and nuclear expertise. Kazakhstan does not anticipate any tenders for available uranium fields, but would welcome nuclear-related joint ventures with U.S. companies in exchange for their technology and expertise. To meet its ambitious plans of becoming the world's largest uranium producer and operating a full fuel cycle, Kazakhstan will strengthen state supervision of nuclear-related operations.

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